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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,639	10/31/2001	Liu He	4327P005	4461

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EXAMINER
BLACKWELL RUDASIL, GWENDOLYN A

ART UNIT	PAPER NUMBER
1775	10

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/001,639	HE ET AL.	
	Examiner	Art Unit	
	Gwendolyn A. Blackwell-Rudasill	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *22-29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4,6,8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group 1, claims 1-21 in Paper No. 9 is acknowledged.

Claim Objections

2. Claims 1-21 are objected to because of the following informalities:

The preamble of the claims classifies the invention as an apparatus. However, the body of the claim defining the metes and bounds of the claims are structure claims that would be classified as article/product claims. Apparatus type inventions are usually to equipment that is used to perform a certain process. It is suggested to substitute "anti-reflective layer coated substrate" or something similar in place of "apparatus".

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> *A person shall be entitled to a patent unless –*
>
> *(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

4. Claims 1-10 and 12-20 are rejected under 35 U.S.C. 102(b) as being anticipated by European Patent Application Publication no. 1 022 587 A1, EP '587.

EP '487 disclose an anti-reflection coating the can be multilayered. The coating structure in relation to the placement of the high-, low-, and middle-refractive index layers are

demonstrated in figures 1(b) and 1(c). The low-refractive layer is formed on top of the high-refractive index layer, which is nearest to the substrate unless there is a middle-refractive index layer. If a middle refractive index layer is used in the coating, the middle-refractive index layer is formed over the substrate with the high-refractive index layer formed thereon and the low-refractive index layer formed on the high-refractive index, (page 4, sections 0026-0030).

EP '487 disclose that the high index layer has a refractive index ranging from 1.65-2.40 with a thickness of 5 nm – 100 μm. In addition, the high index layer contains inorganic fine particle such as metals, meeting the requirements of claims 1-4, 12, and 15-16, (pages 5-6, sections 0036-0053).

EP '487 further disclose that the low index layer has a refractive index ranging from 1.20-1.55 having a thickness from 50-400 nm. Silicon dioxide can be contained in the low index layer, (page 11, sections 0097-0105). The binder polymer used in the low index layer can be a monomer having two or more ethylenic unsaturated groups such as a methacrylic acid, (pages 15-16, sections 0153-0160). Example 1 demonstrates that UV light is used to cure the high and low index layers, meeting the requirements of claims 5-10 and 17-20, (page 19, sections 0192-0196).

EP '487 continue to disclose a middle index layer that is located between the substrate and the high index layer. The refractive index for the middle index layer ranges from 1.55-1.70. Inorganic particles can also be added to the layer, (pages 16-17, sections 0166-0175). Example 12 demonstrates that the middle index layer can have a thickness of 75 nm, meeting the requirements of claims 13-14, (page 26, section 0241).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 11 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over European Patent Application Publication no. 1 022 587 A1, EP '587 as applied to claims 1-10 and 12-20 above, and further in view of United States Patent no. 4,765,729, Taniguchi.

EP '587 disclose the limitations of claims 1-10 and 12-20 above. In addition, the low index layer includes a silane-coupling agent, (page 12-14 sections 0121-0136). Furthermore, the low index layer can contain also contain initiators for the polymerization of the inorganic particles, (page 15, sections 0147-0148). EP '587 do not specifically disclose the type silane agents as exemplified by Applicant.

Taniguchi et al disclose an anti-reflection film wherein the film utilizes crosslinked polymers to improve heat, hot water and chemical resistance, (column 3, lines 50-53). Organic silicon compounds such as trialkoxysilanes, dialkoxysilanes, (column 4, lines 3-49), and tetraalkoxysilane, (column 7, lines 1-16), can be used in the film. In addition to the above-mentioned compounds a fluorine containing mixture such as a perfluoro group containing (meth)acrylate can be added to the silicon compounds, (column 7, lines 21-25).

EP '487 and Taniguchi et al disclose inventions that are utilized in the formation of anti-reflective films. EP '487 disclose that silane-coupling agents are used in the low index layer. Taniguchi et al disclose organic silicon compounds that are used as crosslinking agents wherein the formula used by Taniguchi et al, (column 3, line 5), satisfies the formula requirements as set forth in EP '487 that can be used as a coupling agent, (page 13, sections 0121-0126). As such, it would have been obvious to one skilled in the art to use the organic silicon compounds of Taniguchi et al in the anti-reflection film of EP '487 to create a low index layer that has improved heat, hot water and chemical resistance, (Taniguchi et al, column 3, lines 50-53).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

United States Patent no. 6,277,485, disclose general information on anti-reflective films and anti-soiling coating provided thereon.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gwendolyn A. Blackwell-Rudasill whose telephone number is

(703) 305-9741. The examiner can normally be reached on Monday - Thursday; 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gwendolyn A. Blackwell-Rudasill
Examiner
Art Unit 1775

gbr
June 1, 2003

DEBORAH JONES
SUPERVISORY PATENT EXAMINER